

## CLAIMS

What is claimed is:

1        1. An apparatus for testing equipment located in a local environment by  
2 presenting a detectable indicator gas therein, said apparatus comprising:  
  
3        a container portion;  
  
4        a chemical substance stored in said container portion;  
  
5        a pump operable to draw air into said container and in contact with said chemical  
6 substance to generate a detectable indicator gas, wherein said pump is integrally formed as  
7 one piece with said container portion; and  
  
8        an outlet to said container for directing said indicator gas into the local environment.

1        2. The testing apparatus of claim 1, wherein said pump is a manually squeezable  
2 bulb.

1        3. The testing apparatus of claim 1, wherein said pump is selected from the group  
2 of manually operable pumps consisting of: a manually squeezable bulb, a bellows-driven  
3 pump, a syringe, and combinations thereof.

1        4. The testing apparatus of claim 1, wherein said pump is joined seamlessly with  
2 said container portion.

1        5. The testing apparatus of claim 1, wherein said container portion and said  
2 pump are formed from a plastic material.

1           6.     The testing apparatus of claim 5, wherein said plastic material is low density  
2     polyethylene.

1           7.     The testing apparatus of claim 1, wherein said container portion is formed  
2     from a first material and said pump is formed from a second material distinct from said first  
3     material.

1           8.     The testing apparatus of claim 1, wherein said container portion and said  
2     pump are formed from a laminate of at least a first material layer and a second material layer  
3     distinct from said first material layer.

1           9.     The testing apparatus of claim 1, wherein said container portion and said  
2     pump form a substantially permanent molded structure.

1           10.    The testing apparatus of claim 1, wherein said chemical substance is reactive  
2     with the container environment, upon operation of the pump, to generate said indicator gas.

B1        11.    The testing apparatus of claim 1, wherein said chemical substance is selected  
2     such that said chemical substance and air drawn into said container portion generate a scented  
3     indicator gas upon contact.

1           12.    The testing apparatus of claim 1, wherein said chemical substance is reactive  
2     with air to produce an irritant gas.

1           13. The testing apparatus of claim 12, wherein said chemical substance is liquid  
2        SnCl<sub>4</sub> and said indicator gas is an acid vapor fume.

1           14. The testing apparatus of claim 1, wherein said chemical substance is reactive  
2        with the container environment, upon operation of the pump, to generate a visually detectable  
3        indicator gas.

*2d*  
*B,*      1       15. The testing apparatus of claim 1, wherein said pump has a hole to allow finger  
2        release of pressure      *3*

1           16. The testing apparatus of claim 1, further comprising an exterior layer of  
2        laminate that seals the container.

1        17. A method of manufacturing an apparatus for testing equipment in a local  
2        environment by presenting a detectable indicator gas therein, said method comprising the  
3        steps of:

4        *Sub Obj* providing a flexible material;

5        integrally forming, as one piece, a container portion and a squeeze bulb portion using  
6        the flexible material; and

7        storing a chemical substance in the container portion such that upon operation of the  
8        bulb to draw air into the container portion, a detectable indicator gas is generated for  
9        presentation into the local environment.

1        18. The method of claim 17, wherein the flexible material is plastic.

1        19. The method of claim 17, further comprising the step of sealing a breakable end  
2        tip of the container tube portion located opposite the squeeze bulb.

1        20. The method of claim 17, wherein the step of storing includes storing a  
2        chemical that, when contacted by air drawn into the container portion generates a visually  
3        detectable indicator gas.

1        21. The method of claim 17, further comprising the steps of providing a second  
2        material distinct from the plastic material, whereby said integrally forming step includes  
3        forming said container portion and said pump from a laminate comprising said plastic  
4        material and said second material.

1        22. A method of testing equipment in a local environment by presenting a  
2 detectable indicator gas therein, said method comprising the steps of:

3              storing a chemical substance, reactive with air to produce an indicator gas, in a  
4 container formed substantially from a polymeric material;

5              providing a polymeric squeeze bulb device in operative communication with the  
6 container and formed integrally, as one piece, therewith;

7              breaking a portion of the container tube to provide an outlet;

8              operating the squeeze bulb to draw air past the chemical substance to produce a  
9 human detectable indicator gas;

10             directing the indicator gas outward of the container and into the local environment;

11             and

12             detecting the indicator to determine the operability of the equipment in the local  
13 environment.

1        23. The method of claim 22, wherein the indicator gas is a visually observable  
2 gas, said detecting step including visually observing the behavior of the indicator gas in the  
3 local environment.

1        24. The method of claim 23, wherein said observing step includes visually  
2 observing the flow of the indicator gas in the local environment.

1        25. The method of claim 22, wherein the chemical substance is liquid  $\text{SnCl}_4$  or  
2  $\text{H}_2\text{SO}_4$  and said step of operating the squeeze bulb generates a chemical reaction producing  
3 an irritant indicator gas.

26. The method of claim 22, wherein the indicator gas is indicator gas having a pre-selected scent, said observing step including detecting the scent of the indicator gas to determine the operability of the equipment.

- 1        27. A testing method of indicating air flow, said method comprising the steps of:
- 2              storing a chemical substance, reactive with air to produce an indicator gas, in a sealed
- 3              container tube formed substantially from a polymeric material;
- 4              providing a polymeric squeeze bulb device in operative communication with the
- 5              container tube and integrally formed seamlessly therewith;
- 6              breaking a portion of the container tube to provide an indicator gas exit;
- 7              operating the squeeze bulb to draw air past the chemical substance to generate a
- 8              reaction producing a visually observable indicator gas;
- 9              directing the indicator gas outward of the container into the vicinity of the desired air-
- 10          flow testing area; and
- 11          visually observing the indicator gas in the air-flow testing area.

1        28. An apparatus for fit testing a respiratory protection devices using a detectable  
2 indicator gas placed in the vicinity of the respiratory protection device, said apparatus  
3 comprising:

4        a container portion;

5        a chemical substance stored in said container portion; and

6        a squeeze bulb integrally formed as one-piece with said container portion, said  
7 squeeze bulb being operable to draw air into the container portion to generate a reaction  
8 between said chemical substance and the air, and to produce a detectable indicator gas.

1        29. The apparatus of claim 28, wherein said squeeze bulb and said container  
2 portion are formed from a polymeric material.

1        30. The apparatus of claim 28, wherein said chemical substance is liquid  $\text{SnCl}_4$   
2 reactive with air to produce an irritant vapor fume.

1        31. The apparatus of claim 28, wherein said container portion and said squeeze  
2 bulb form a molded seamless one-piece structure.

add 25